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Components or arrangement with such components, and clip for same

Description

The invention relates to structural members or components or an arrangement with such components according to the preamble of Claim 1.

Such arrangements or components are known from German Utility Model DE 297 10 175 U1.

It is an object of the invention to allow the simple manufacture of such components and clips as well as to allow that with the clips, the components can be laid and joined together easily, quickly and with precision. A substantial object of the invention is to facilitate the glueless, quick and durable laying of a floor and its easy and non-destructive dismantling.

In accordance with the invention, these objects are achieved with an arrangement of the kind mentioned above, according to the characterizing clause of Claim 1. It is a particular advantage of the arrangement according to the invention when the clip, whose free end section may include a locking element, extends, in unstressed position, upward from the clip base, in the direction obliquely to the plane defined by the edges of the components, or, in a stressed position, the clip can be elastically deflected downward. The characteristics of the invention, the simple design of the clip and the easy manufacture of the components ensure that the clip can be applied quickly, that the components can be joined together simply and with precision, and that the bond is good and firm. If the components according to the invention are laid and glued as well, no clamping means are necessary, since the clips hold the components under tension until the glue or other adhesive is cured.

An advantageous connection between the clip and a component to which an adjacent component is to be joined, is produced when the method according to the features of Claim 4 is followed. A precise and firm bond is accomplished when the features of Claims 7 or 9 are applied.

A simple, strong clip, which holds the components well in their position, results when the method described in Claim 5 is followed.

Advantageous for laying the components with precision and for ensuring a firm fit of the clips are the characteristics of Claims 11 and/or 16.

The invention also relates to a clip for components or for an arrangement of the kind mentioned above, which is easy to manufacture and can join the components firmly together, in accordance with the preamble of Claim 20, and which, according to the invention, is defined by the characterizing clause of Claim 20.

Advantageous embodiments of the invention are explained in the following description, in the claims and in the drawings.

Examples of the invention are described in detail with reference to the drawings, where

Figs. 1 and 1a show the longitudinal joining of two components in a diagrammatic sectional view;

Fig. 1b shows the bottom view of a component;

Fig. 2 shows a top view of a clip;

Fig. 3 shows a diagrammatic side view of two components joined longitudinally according to another embodiment of the invention;

Fig. 4 shows how two components are joined, at their narrow ends;

Fig. 5 shows a diagrammatic view of a component, as seen from its longitudinal side;

Fig. 5a shows in schematic view how two components are joined by their end edges.

Fig. 1 shows a first embodiment of the invention, according to which two elongated components 1 and 2, which are rectangular when seen in a top view, such as floor panels, are joined together lengthwise, and are disposed on the floor or on a support not shown, and are aligned along a wall 42 as shown in Fig.

1a.

The left component 1, which is shown only partly in Fig. 1, is provided, on its right edge 7, with a projection in the form of a tongue 6 and, on the other edge, shown only in phantom lines and abutting against the wall 42, with a recess in the form of a groove 5; this component 1 is joined to component 2 which is provided on its edge 7 shown in the drawing with a recess in the form of a groove 5, bordered by two legs 3, 4, and on its opposite edge with a tongue 6 shown in broken lines. Instead of these projections and recesses, it is also possible to form stepped shoulders, keys, etc. or several parallel tongues and grooves. The underside 15 of each of the components 1, 2 is provided, at portions near each of its two longitudinal edges, and near each of the transverse end sections with a recess 8, 9 or 8', 9', which extends substantially parallel to the edge 7 and serves to accommodate retaining elements in the form of flange elements 10 and detents 12, as shown in Fig. 1b. The flange element 10 and the detent 12 are formed from a clip base body 17 of a clip 11, and they engage in recesses 8, 9 or 8', 9'. In Fig. 1, components 1, 2 are shown as seen in the direction as viewed in the direction away from their transverse, short end edges 7', and the cross section of the recesses 8, 9 extending parallel to the long edges of components 1, 2 can be seen.

Clip 11 is brought in position on or snapped onto component 1 by means of flange element 10, which is bent upward from the clip base17, and by means of another flange element 19, which can be applied to the longitudinal edge 7 of component 1 in an edge portion 22. The edge-proximate inside surface 13 of recess 8 and the edge portion 22 together with the flange elements 10 and 19 that can be applied to these surfaces are disposed at a corresponding slant in relation to the above, or the angle of incline of contact surfaces 13, 22 is adapted to this dovetailed section 42 of component 1, so that clip 11 can be snapped into this dovetailed part and held in position there.

In the sector referred to as 30 in Fig. 1, a resilient detent 12 extends in unstressed position from the clip base edge 17 upward in the direction oblique to the plane formed by the abutting edges 7 of components 1 and 2.

Advantageously, it can be provided in this case that detent 12 runs obliquely upward from clip base body 17 at an angle β between 10° and 30°, preferably between 15° and 25°.

The detent 12 is provided at its forward portion with a locking element 18, which is curved or bent upward and can be placed so that its whole surface or its end or an end rim can be applied to the edge-proximate inside surface 20 of recess 9, and so that in applied position it exerts a spring action upon the downward-pivoted component 2 via this inside surface 20 in the direction toward the component 1.

In Fig. 1 it is shown how the components 1, 2 are joined together. After the clip 11 was initially fastened to component 1, component 2 is placed from the top, or at an angle of about 60° to 80° from the top, by edge-proximate leg 3 of groove 5 onto the tongue 6 of component 1, and then, while component 2 is simultaneously pivoted downward, groove 5 is pushed onto tongue 6. During this pivoting movement, as shown by arrow 40, recess 9 is brought close to the upwardly projecting locking element 18, and locking element 18 enters recess 9, as shown by reference 31. When component 2 is lowered further, locking element 18 comes in contact with the inside surface 20 of recess 9 and pushes component 2 in the direction of the other component 1. At the same time, component 2 is also pushed in that direction by hand, so that groove 5 fully snaps onto tongue 6. Eventually, component 2 is pivoted onto the plane of component 1 and, as indicated in Fig. 4 by reference 32, the upper edge areas of components 1, 2 adjoin each other without gap and are under pressure from locking element 12. In section 33, the two opposite edge areas 22 have a space between them at bottom level, especially to make room for the additional flange element 19 of clip 11 or to allow the attachment or application of the element to one of the edge areas 22 at bottom level. This space is also used to compensate for uneven parts of the floor and to prevent surface 14 from cracking.

When the locking element 18 has entered recess 9, the rounded profile of the locking element 18 contacts edge 35 of recess 9. When component 2 is pivoted further, locking element 18 snaps into final position about this edge 35,

where surface 20 is pressed downward and in the direction of component 1 by locking element 18. Since the edge-proximate inside surface 20 is provided with an undercut or beveled configuration, the joint is prevented from becoming loose by itself.

Advantageously, detent 12, as shown by reference 36, is somewhat concavely curved downward, to facilitate the bending and snapping-back of the resilient detent 12.

In the embodiment shown in Fig. 1 and 4, the two recesses 8, 9 provided in each of the two components 1 and 2 are mirror-symmetrical. If edge area 22 of the two components 1 and 2 at bottom level, which are opposite each other, also have mirror-symmetrical abutting surfaces, it is possible to apply clip 11 either to the edge portion of component 1 which is provided with tongue 6, or to the side section of component 2 which is provided with groove 5. The preferred method is to apply clip 11 to the edge portion of a component 1, 2 provided with tongue 6, since it is easier to attach groove 5 to tongue 6 while pivoting component 2 than in reverse order.

The position of clip 11 also depends on the incline of edge area 22; clip 11 will fit more firmly to component 1 if edge area 22 has an appropriate incline.

Fig. 3 shows a schematic cross section of an embodiment or method of the invention, according to which a component 2 is joined to component 1 from the side by pushing it horizontally. In principle, this method can be used to join the longitudinal edges of components 1 and 2 according to Fig. 1, but advantageously it is used for joining the transverse narrow end edges 7' of the two components 1, 2. In this case, either the already laid component 1 can be slightly lifted with its attached clip 11, or else component 1 with clip 11 can be placed on a soft, resilient base such as a sound insulation underlay, to allow detent 12 to be moved or deflected downward. As soon as component 2 is moved toward component 1 in substantially horizontal direction as shown by arrow 34, the detent with locking element 18 is pushed below the plane of clip base body 17, and groove 5 can be pushed onto tongue 6. As soon as groove 5 has been pushed onto tongue 6, the edge-proximate inside surface 21 of recess

9, which slants diagonally toward the top right, comes to rest above locking element 18, then locking element 18 snaps into or enters recess 9, abuts resiliently against the inside surface 21 and thus prevents the unlocking of the tongue-and-groove joint of component 2 and component 1.

To allow the sliding of a component 2 as described in connection with Fig. 3 beyond the pushed-down detent 12, in particular without damaging locking element 18, the aforesaid locking element 18 is deflected at such a curve that it cannot hook onto component 2. Furthermore, detent 12 is carefully deburred to prevent it from becoming caught.

Fig. 2 shows a top view of a clip 11 according to the invention. Clip 11 has an approximately rectangular circumference, and advantageously it is produced by stamping out a thin, resilient material. The flange element 10 is bent upward from clip base body 17. It is advantageous when in the lateral end sections of flange element 10 and/or the other flange element 19, engagement elements 41, in particular hooked or pointed deflections, are provided. This prevents clip 11, which snaps into section 42, from sliding in lateral direction. Located opposite flange element 10 is the other flange element 19, which is also bent upward from clip base body 17. A stamped-out area 37 limits the other flange element 19 and detent 12. It is advantageous when at least one recess 28 is formed in the transitional or joint area 38 between the detent 12 and the clip base body 17. The spring force of detent 12 can be adjusted to the size, especially the width, of recess 28.

It is advantageous if the clip 11 is symmetrically designed so that its centre plane is perpendicular to the direction of the flange elements 10, 19. It can also be provided that in a clip base body 17, a multiple of flange elements 10, 19 and/or detents 12 are formed, lying side by side in a row. It is also possible to have a combination of several flange elements 10 or 19, which lie opposite each other, perhaps in staggered fashion, and one or more detents 12.

The spring action of detent 12 prevents components 1 and 2 from moving apart; however, due to the spring action, the components are allowed a certain degree of expansion, particularly in response to moisture.

Fig. 4 shows recesses 8, 9 of two components 1, 2 joined to each other along their longitudinal edges 7; the abutting planes of these recesses are mirror-symmetrical. It is evident that the edge-proximate inside surface 20 of recess 9, against which detent 12, (which extends diagonally upward) can abut, especially with its bent-away or curved locking element 18, encloses an angle (α) of less than 90° with surface 15 of component 1, preferably an angle between 60° and 80°, and that the edge-proximate inside surface 13 of recess 8, against which flange element 10 can abut, encloses the same angle (α') with surface 14. Insofar as edge area 22' has the same incline as edge area 22, either area 44 or 44wherein can be chosen for snapping a clip 11 into flange elements 10 and 19.

In Fig. 4 and 5, the horizontal lines 45 indicate the path of a groove or tongue on the narrow or transverse edges 7' or on the longitudinal edges 7 of components 1, 2. To keep the drawing simple, this indication of a groove or tongue in the respective edges of the components was omitted in Fig. 1 and 3. In practice, a groove is provided on the longitudinal and transverse edge of a component, while a tongue is provided on the other transverse edge, so that the components can be laid in such a way that they are joined either by their longitudinal edges or by their narrow edges; the clips according to the invention can be used to produce a joint on the longitudinal edges as well as on the short end edges.

As shown in Fig. 5a, it is advantageous to begin by laying a component 1 by one of its edges, preferably the grooved longitudinal edges 7, against a wall 42 of a room and, as shown in Fig. 1 and 5a, by connecting another component 2 to its tongued edge. When another row of components 1, 2 is laid beside it, also extending out from wall 42, it becomes necessary to join components 1, 2 of the new row to the components of the previously laid row along their narrow edges. This is accomplished by means of the recesses 8', 9' in components 1, 2 which extend along the end edges 7', as shown in Fig. 1b and 5, or by means of the method described in connection with Fig. 3. As soon as two components 1, 2 of a new row, as shown on the right in Fig. 5a, are joined either by pivoting in accordance with Fig. 1 or by pushing-in according to Fig. 3, the component of

the new row to be added can be pushed in the direction of the end edge of the corresponding already laid component. This component 2, which can be pushed as indicated by arrow 43, is already held on its longitudinal edge by clips 11 and can no longer be moved away from the already laid component 1. Before pushing in the direction of the narrow edge 7' of the already laid component 1, at least one clip 11 was fastened to narrow edge 7' of the laid component, and this clip is projecting from said narrow edge 7'; as indicated by arrow 43 in Fig. 5a, component 2, which is to be newly inserted, is pushed over detent 12 - or according to Fig. 3 over the upward-extending locking element 18 of detent 12 - and thus fixed.

It was found that it is advantageous when recesses 8, 9, which extend parallel to the longitudinal edges 7 of components 1, 2, are mirror-symmetrical and provided with undercut inside surfaces 13 and 20. On the other hand, it was found that it is advantageous when recesses 8' 9' which extend parallel to the end edges 7' of components 1, 2, are not mirror-symmetrical but have comparable inclined inside surfaces 13, 21. The inside surface 13 of recess 9' , for accommodating flange 10 of clip 11, is undercut, as shown in Fig. 5, while the inside surface 21 of the recesses which extend along the opposite transverse edge 7' is not undercut.

Recess 8' along transverse edge 7' has the same cross section as recess 9 in Fig. 3, where, however, it was described as a special case or special embodiment.

To allow locking element 18 to snap into recess 8', it is necessary that the inside surface 21 has at least a vertical position in relation to the underside 15 of component 1; however, it is advantageous, especially in view of the fact that the end of detent 12 describes a circular path when pivoted, and also to ensure that detent 12 abuts correspondingly to inside surface 21, that inside surface 21 describes a corresponding angle (α') in relation to detent 12 or its area 30. This angle also ensures that, should the components shrink or expand, the detent or its contact surface or edge sits firmly on the inside surface, or that this inside surface can slide up and down on this contact surface exerting a pressure.

It can be provided, for the formation of edge 35 or to facilitate the snapping-in of locking element 18 in an embodiment of clip 11 according to Fig. 1, that the edge-proximate area of recess 9, which accommodates detent 12, is beveled, reduced in size or rounded, as indicated by reference 23.

In Fig. 4, it is indicated that the edge-distant inside surface 29, remote from the end edge, of recess 9 for detent 12 is inclined at an angle γ between 15° and 40°, preferably between 20° and 35°, in relation to surface 14. In principle, the remote inside surface 29 may have various shapes; it must be formed in such a way that it does not counteract the entry of locking element 18 of detent 12 in recess 8 while component 2 is pivoted.

Advantageously, recesses 8, 9, 8', 9' or grooves 5 and tongues 6 are cut out, in particular milled out, from components 1, 2. Finishing coats for components 1, 2 on top surface 14, underside 15 and in some cases on edges 7 are not shown and can be chosen at random. Components 1, 2 could be made of any material that can be machined in such a way that recesses 8, 9, 8', 9' can be produced easily and with precision.

The clips 11 are punched-out parts which in particular can be manufactured in one production run. The clip base body 17 and/or the detent 12 can be reinforced by means of appropriate inserts or beading.

The angles at which the flange elements 10, 19, the detent 12, the inside surfaces 20, 21 or 13, and the edge area 22 are inclined in relation to surface 14 of components 1, 2, can be varied from section to section; these angles should mainly ensure the easy application or snapping of clips 11 to the appropriate components 1, 2, and ensure the trouble-free penetration of locking element 18 into recess 9 while providing a firm hold.

The number of clips 11 to be attached along one of the edges 7, 7' of components 1, 2 is optional. The clips are fastened at intervals of approximately one every 60 cm.